

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

PATENT APPLICATION

OF

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FOR

PROJECTILE LAUNCHER INCLUDING AUDIOVISUAL STIMULI

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TITLE: PROJECTILE LAUNCHER INCLUDING AUDIOVISUAL STIMULI

BACKGROUND OF THE INVENTION

5 **1. Field of the Invention**

The present invention relates generally to a projectile launcher and, more particularly, to toy gun or firearm for launching projectiles such as toy balls, arrows, disks and the like, wherein the launcher includes a mechanism for producing an audio or visual stimulus that is timed to coincide with the launch of the projectile so as to startle, disorient or otherwise affect the projectile's target.

15 **2. Description of the Prior Art**

Toy guns and projectile launchers have long been known in the art. A subset of such projectile launchers are those toy guns that utilize air pressure or springs to propel the projectiles from the launcher's barrel toward the intended target.

An example of such a launcher is shown in U.S. Patent No. 3,540,426 which issued to Lohr, et al. on November 17, 1970 for an "Air Gun" which uses an air supply provided by a spring-expanded bellows compressed by a spring-loaded piston to expel a plastic projectile situated in the barrel of the gun.

A somewhat more sophisticated launcher is disclosed U.S. Patent No. 5,343,849, which issued to Steer on September 6, 1994

for a "Rapid Fire Ball Gun" which uses an air pump coupled with a pressurizable air vessel through a check valve, whereby a trigger mechanism serves to open the valve and release pressurized air to expel compressible foam balls which are stored within a

5 cylindrical barrel. The use of a separate pressurizable air vessel or bladder is also disclosed in U.S. Patent No. 5,373,833, which issued to D'Andrade on December 20, 1994 for "Projectile Shooting Air Gun With Bladder," which patent discloses the use of an inflatable bladder and a pressurizing mechanism for inflating
10 it, the pressurizing mechanism being a hand-operated pump that is designed to replicate the pump action of a shotgun. In a separate patent issued (U.S. Patent No. 5,529,050) to D'Andrade on June 25, 1996 for "Safety Nozzle for Projectile Shooting Air Gun," a safety mechanism is further disclosed for preventing or
15 inhibiting the launch of "undesirable" projectiles.

The use of a piston and cylinder assembly to produce compressed air for launching a projectile is disclosed in U.S. Patent No. 5,377,656, which issued to Lewinski et al. on January 3, 1995 for a "Toy Gun." A combination of spring, piston and
20 pump is used to generate the air power required to launch a projectile in U.S. Patent No. 5,653,215, which issued to Chung et al. on August 5, 1997 for an "Air-Powered Projectile Launcher."

Other examples of air-powered projectile launchers are disclosed in U.S. Patent No. 6,276,353, which issued to Briggs et
25 al. on August 21, 2001 for a "Projectile Launcher" and U.S.

Patent No. 5,429,108, which issued to Hsieh on July 4, 1995 for an "Air-Operated Toy Gun."

Many of these launchers include added mechanisms, such as viewfinder or sights. Examples include U.S. Patent No.

5 5,901,693, which issued to Smith on May 11, 1999 for a "Toy Gun Having an Offset Projectile Launch and Transparent Viewfinding Plunger" and U.S. Patent No. 5,975,068, which issued to Halter et al. on November 2, 1999 for a "Toy Gun Having a Retractable Sight."

10 Yet another example of a toy projectile launcher is described in U.S. Patent No. 6,119,671, which issued to Smith et al. on September 19, 2000 for a "Toy Projectile Launcher" which includes a first and second barrel pivotally attached to each other wherein the second barrel is axially aligned with the first
15 barrel for firing the projectile from the second barrel.

An example of a projectile launcher that fires a glowing projectile, albeit not in connection with a flash of light, is disclosed in U.S. Patent No. 5,415,151, which issued to Fusi, et al. on May 16, 1995 for "Phosphor-containing projectile and
20 launcher therefor" which describes a toy launcher and a phosphor-containing projectile, wherein the launcher includes a radiation emitter for exposing the projectile to phosphorescence-activating radiation prior to launch such that the projectile will phosphoresce as it leaves the launcher.

As will be appreciated, none of these prior patents even address the problem faced by applicant let alone offer the solution proposed herein.

SUMMARY OF THE INVENTION

Against the foregoing background, it is a primary object of the present invention to provide a projectile launcher that includes a mechanism for generating an audiovisual stimulus to
5 startle, disorient or otherwise attract the attention the intended target.

It is another object of the present invention to provide such a projectile launcher capable of firing a plurality of
10 projectiles.

It is but another object of the present invention to provide such a projectile launcher that utilizes air pressure to propel the projectile.
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It is another object of the present invention to provide such a projectile launcher that utilizes a spring mechanism to propel the projectile.

20 It is still another object of the present invention to provide such a projectile launcher capable of generating a flash of light while simultaneously launching a projectile.

It is yet another object of the present invention to provide such a projectile launcher capable of generating an explosive sound while simultaneously launching a projectile.

5 It is another object of the present invention to provide such a projectile launcher that includes a pumping mechanism that allows a user to generate the air pressure required to launch the projectile.

10 It is still yet another object of the present invention to provide such a projectile launcher capable of launching foam arrows.

 It is but another object of the present invention to provide
15 such a projectile launcher capable of launching foam disks.

 To the accomplishments of the foregoing objects and advantages, the present invention, in brief summary, comprises a projectile launcher including a barrel wherein the projectile or
20 projectiles are stored prior to their launch and a mechanism for launching said projectile, said mechanism being coupled with a user-operated trigger mechanism for initiating the launch of the projectile. Also coupled with the trigger mechanism is a mechanism for generating an audiovisual stimulus, whereby said
25 stimulus is generating simultaneously upon the launch or

independently of the launch of the projectile such that the stimulus serves to surprise, disorient, or otherwise attract the attention of the intended target. In the preferred embodiment, an air-powered mechanism is utilized for launching the
5 projectile, said air-powered mechanism including a user-operated pump that serves to compress air in a pressurizable tank, which compressed air is then released so as to propel the projectile when the user pulls the trigger on the projectile launcher. In this preferred embodiment, a second barrel is disposed directly
10 above the barrel in which the projectiles are stored, said second barrel housing a strobe or other bright light, which light is also activated when the user pulls the trigger such that the light flashes simultaneously upon the launch of the projectile. A variety of projectiles are contemplated, including discs,
15 arrows, darts and the like, and a variety of different mechanisms for propelling the projectiles are likewise contemplated, including spring means, magnetic means, elastic means, and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and still other objects and advantages of the present invention will be more apparent from the detailed explanation of the preferred embodiments of the invention in
5 connection with the accompanying drawings, wherein:

FIG. 1 is a cut-away view of the projectile launcher of the present invention;

10 FIG. 2 is a perspective view of the projectile launcher of FIG. 1; and

FIG. 3 is a perspective view of an alternate embodiment of the projectile launcher of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings and, in particular, to FIG. 1 thereof, the new projectile launcher of the present invention referred to generally by reference numeral 5 is shown. The projectile launcher 1 includes a barrel 10 in which one or more projectiles 12 are received and retained prior to launch. The projectiles are inserted into the barrel through the opening 14 which opening 14 is slightly larger in diameter or area than the diameter or cross-sectional area of the projectile 12.

10 Similarly, the shape of the interior surface 16 of the barrel 10 corresponds to the shape of the projectiles 12 such that the projectiles 12 fit securely within the barrel 10 with very little to no space between the projectile 12 and the interior surface 16. Ideally, the interior surface 16 should be smooth and not
15 contain any imperfections or projections that could hinder or alter the travel of the projectile 12 through the barrel 10.

In the preferred embodiment, as shown in FIG. 1, the projectiles 12 are spherical foam balls, and the barrel 10 is
20 cylindrical in shape. It should be appreciated that the cylindrical shape of the barrel 10 is also ideally suited for other projectiles 12 having a circular cross-section, such as arrows or darts. In fact, channels may be included within the barrel 10 so as to accommodate the "fletching" of an arrow or
25 dart so as to allow for a more realistic looking projectile 12.

The cross-sectional shape of the barrel 10 may be altered so as to accommodate projectiles 12 of different sizes or shapes. For example, the barrel 10 for a disc-shaped projectile would be more rectangular or ovoid-shaped in cross-section, as illustrated in FIG. 5. It will be appreciated that other forms and configurations for the projectile launcher of the present invention is possible.

In addition to the barrel 10, the projectile launcher 5 of the preferred embodiment includes a handle 18 and pump action mechanism 20, the latter being designed to allow a user to slide the mechanism 20 back and forth along the length of the barrel 10 so as to generate potential energy, the release of which is utilized to propel the projectiles 12. Two means of storing potential energy are contemplated in the preferred embodiment - air pressure and compressible spring means. The former means uses air pressure which is built up in a separate compartment 22 by means of the user pumping the pump action mechanism 20, which air pressure is controlled by a pressure valve 24. The pressure valve 24 releases the pressurized air either upon the triggering by the user or once a certain pressure is achieved. The spring means of storing potential energy utilizes a compressible spring 26 which is compressed either by the insertion of projectiles 12 within the barrel 10 or by means of the user-activated pump action mechanism 20. A plunger 28 is attached to the end of the

compressible spring 26, which plunger 28 serves to propel the projectile 12 through the barrel 10. The spring 26 may be released either upon the activation of a trigger by the user or once it has been compressed by a predefined amount.

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A mechanism for generating an audiovisual stimulus 30 is disposed adjacent to the barrel 10, said audiovisual mechanism 30 being designed to generate either an visual stimulus such as a bright flash of light or strobe, or an audio stimulus such as the
10 sound of an explosion or a gunshot, which stimuli serve to disorient, startle, or otherwise attract the attention of or affect the target of the projectile 12. In fact, a combination of stimuli may be generated, such as a bright flash of light and the sound of a gunshot, to further heighten the effect of the
15 projectile launcher 5.

In the preferred embodiment, the audiovisual mechanism 30 comprises a light flash generator 32 coupled with a transparent flash light tube 34, the flash light tube 34 serving to direct
20 and amplify the light generated by the light flash generator 32. The flash light generator 32 is powered by a battery 36, which battery 36 may also be used to power a mechanism for propelling the projectile 12, such as an air compressor (not shown). In addition to the light flash generator 32, other audiovisual
25 stimuli are contemplated, such as the use of a sound effects

generator 37 coupled with a speaker 39, which components are also powered by battery 36.

5 In the preferred embodiment, the battery 36 is stored in a compartment 38 situated behind the flash light tube 34 and above the barrel 10, the flash light tube 34 and battery 36 being electronically connected. In such embodiment, the compartment 38 is also attached to the handle 18, the latter of which houses the power switch 40 which is electronically connected to the battery
10 36 and alternatively activates and deactivates all the electronic components of the toy projectile launcher 5 of the present invention.

A activation switch 42 is also disposed on the handle 18,
15 which activation switch 42 can serve various purposes. First, the activation switch 42 may be electronically connected to the audiovisual mechanism 30 to thereby activate said mechanism 30 upon the depression of the activation switch 42 by the user. Alternatively, the activation switch 42 may be connected to the
20 mechanism for propelling the projectile 12 such that depression of the activation switch 42 either releases the spring 26 and plunger 28, or opens the valve 24 thereby releasing the compressed air from the compartment 22, causing the projectile 12 to be expelled from the barrel 10. In yet a third embodiment,
25 the activation switch 42 may be connected to both the audiovisual

mechanism 30 and the mechanism for propelling the projectile 42 such that the projectile 12 is launched and the audiovisual stimulus is generated concurrently therewith.

5 A separate trigger 44 may also be disposed either on the flash light tube 30 or on the barrel 10, which trigger 44 may be used to detect the activation of the mechanism for propelling the projectile 12 such that the trigger 44 sends a signal to the audiovisual mechanism 30 upon the launch of a projectile 12 so as
10 to generate an audiovisual stimulus concurrently therewith. Such trigger 44 eliminates the need to have the activation switch 42 activate both the audiovisual mechanism 30 and the mechanism for propelling the projectile 12. In fact, the trigger 44 eliminates the need for the activation switch 42 entirely, allowing the
15 projectile 12 to be launched independently.

 In the embodiment shown in FIG. 1, a separate ball keeper 46 is provided above the flash light tube 30 for storage of unused projectiles 12.

20 In an alternative embodiment, as shown in FIG. 3, the toy projectile launcher 5 is designed to launch discs 48, which discs 48 are loaded into the launcher 5 through an opening 50 in a cylindrical access port 52 above the barrel 10. It should be
25 appreciated that various other configurations of the projectile

launcher 5, and in particular the barrel 10, are contemplated in order to launch projectiles 12 of various sizes and shapes. For example, in addition to the spherical and disc-shaped projectiles 12 shown herein, other possible projectiles include darts, arrows, rocket-shaped missiles, airplanes and the like. Most of these projectiles 12 only require a slight modification to the shape of the barrel 10 and the interior surface 16 thereof.

In the preferred embodiment, the projectiles 12 are composed of a soft or light material such as foam, although other materials would be equally effective, such as plastic or rubber. Alternatively, the projectile 12 could actually be a stream of water or light.

In addition, a variety of other audiovisual stimuli are contemplated in addition to the light and/or sound generated by the audiovisual mechanism 30. For example, a puff of smoke might be discharged upon the launch of a projectile or a siren could flash and blare upon the firing of the projectile launcher 5. Multiple lights or sound effects are similarly contemplated.

Furthermore, while the means of using compressed air or springs to launch the projectiles 12 are the preferred means, other means are contemplated, including magnetic means, air powered means (such as a blower), motorized flywheels, water

pressure and elastic means. The motorized flywheel means is particularly suited as a means for propelling disk-shaped projectiles 48 inasmuch as the flywheel can impart rotational velocity to the projectile itself. In the preferred embodiment, the motorized flywheel is battery operated. The embodiment of the projectile launcher 5 illustrated in FIG. 3 employs such a battery-powered motorized flywheel to propel the disks 48.

Finally, a further extension of the projectile launcher 5 of the present invention is to include the audiovisual stimuli on the projectile 12 itself, such that the projectile 12 produces a sound effect or emits a flash of light when it hits the ground or strikes a target. Alternatively, a target could include the audiovisual stimuli such that the target produces the sound effect or emits a flash of light when struck.

Having thus described the invention with particular reference to the preferred forms thereof, it will be obvious that various changes and modifications can be made therein without departing from the spirit and scope of the present invention as defined by the appended claims.